EFFECT OF MANAGING TECHNICAL RISK TOWARDS REDUCING COST OF PRODUCTION IN PROJECT

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Abstract

In world life today, there are always risks. In a project, the risk will become the strongest obstacle to ensure the project is successful which means it meets the goal without affecting the cost. Risks that appear in projects will affect the cost directly and usually will result in cost overrun. This study focuses on the cost for production which is also an important factor to be managed in a project. This study aims to reduce the production cost for project without affecting the scope and quality of the project. A company is impossible to reduce the cost through cutting in the material being used because it can directly affect the quality. Therefore, the objective of this study is to find whether by managing technical risks according to project phases, the production cost can be reduced. Statistical Package for Social Science (SPSS) software has been used to find the linear regression and Pearson correlation of the questionnaire imposed. The outcome shows that in execution phase, wrong in cost estimation risk is the most important to be managed to reduce the cost, while in planning phase, the environmental risk and operation risk are the most important to be managed to reduce the cost. In future, it is suggested that a comparison is made between two or more company in getting more accurate result and in analyzing the exact value for cost in a sample project. As the conclusion, project managers should focus to manage those risks that have strong relationship to ensure that they can reduce the cost of production in order to maintain the project scope and quality.

Abstrak

Dalam kehidupan dunia hari ini, sentiasa terdapat risiko. Di dalam projek, risiko akan menjadi penghalang yang paling kuat untuk memastikan projek berjaya yang mana ia memenuhi matlamat tanpa menjejaskan kos. Risiko yang muncul dalam sesuatu projek akan memberi kesan secara langsung kepada kos dan biasanya akan menyebabkan lebihan kos. Kajian ini memberi tumpuan kepada kos pengeluaran yang juga merupakan faktor penting yang akan diuruskan dalam sesuatu projek. Kajian ini bertujuan untuk mengurangkan kos pengeluaran bagi projek tanpa menjejaskan skop dan kualiti projek. Adalah mustahil bagi sesebuah syarikat untuk mengurangkan kos melalui pengurangan dalam bahan yang digunakan kerana ia secara langsung boleh menjejaskan kualiti. Oleh itu, objektif kajian ini adalah untuk mencari sama ada dengan menguruskan risiko teknikal mengikut fasa projek, kos pengeluaran dapat dikurangkan. Pakej Statistik untuk Sains Sosial (SPSS) perisian telah digunakan untuk mencari regresi linear dan ujian korelasi Pearson terhadap soal selidik yang digunakan. Hasilnya menunjukkan bahawa dalam fasa pelaksanaan, salah di dalam risiko anggaran kos adalah paling penting untuk mengurangkan kos, manakala dalam fasa perancangan , risiko alam sekitar dan risiko operasi adalah yang paling penting untuk mengurangkan kos. Pada masa akan datang , adalah dicadangkan perbandingan dibuat antara dua atau lebih syarikat untuk mendapatkan hasil yang lebih tepat dan dalam menganalisis nilai yang tepat untuk kos dalam projek sampel. Sebagai kesimpulan , pengurus projek perlu memberi tumpuan untuk menguruskan risiko yang mempunyai hubungan yang kuat dalam memastikan mereka boleh mengurangkan kos pengeluaran bagi mengekalkan skop projek dan kualiti.

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INTRODUCTION

1.1 Title

Effect of managing technical risk towards reducing cost of production in project.

1.2 Background of Study

In the world life today, there are too many projects and high demand from the customers. Besides that, there are also have many companies was built to compete each other. The result of this issue is that some company cannot survive in industries. The other major factor that gives an effect to the company is the cost of production are too high. Nowadays, the increasing of life standard cause the production cost becomes high but unfortunately, the customers still do not want to purchase an expensive product. Company need to fight with their production cost to ensure they can provide a product with low market price and affordable for the customers. Costing is the most important in production because it shows how well the manager manage the project. Cost of production might be affected from many aspects such as scope that does not clear and other problem during the process.

The improvement of our built environment was contributed by the construction projects that are mostly made the national headlines being financial disasters, rather than significant engineering achievements. The investigation made by the government in the middle of 1990s, shows that more than quarter of the construction schemes completes over their capital cost limit (HM Treasury, 1996). Further to this, a survey of construction industry clients was conducted and he was found that nearly one third complained that their projects commonly overran budget (Barrick, 1995). This problem sustained through the latter part of the decade with the Construction at Clients Forum reporting that sixty percent of clients said that cost targets were not being achieved. After a decade, only forty-five per cent of projects are being accomplished within budget. The construction industry has therefore gained a bad reputation for delivering facilities over budget. This main cause of this research was to investigate the problem of construction project cost overruns.

The third phase of a hospital redevelopment project was an example project. At £152m, Guys House doubled its original budget (NAO, 1998). It was reported that there are the increasing some cost which unavoidable due to changes in the health service's statutory requirements, building regulations and a new liability for tax, but other increases might have been avoided. These involve the increasing due to failure to freeze design, significant design changes, and interruptions to the building works, a large number of disputes and claims and the insolvency of major works package contractors. It was clearly shown that the cost increase because of the problem that we never aspect that will be happening during the project.

As we know, the risk was always coming in any running project. The risk will become worst during running the project. When the project run and risk are getting worst affect to the project, it will be automatically affect the cost and then the price also will be affected. This was the relationship we might directly found. Even the risk can be control of the project manager but it is still has a small effect either to the budget or scope of the project. But, if we detect it at the first phase of the project

and provide a contingency plan, the risk might be controlled very well. According to V. M. Rao Tummala and John F Burchett (1999) have stated that in managing a project, a quality system is usually engaged in order to achieve the expectations and objectives of a company. In order to control and optimize the quality in relation to project risks, costs and benefits the quality system should be restructured. It also has to accomplish that project, to get a satisfaction from both internal and external customers. Due to the high inherent risks associated with the building of an extra high voltage (EHV) trans- mission line, a new approach was required to improve the information required to monitor and control such risks which need to be completed on-time and within budget.

Cost overrun and time were related to the projects that cause the risk in construction being the main concern. Besides, risk can be expressed as an exposure to economic loss or gains arising from involvement in the construction process it has regarded this as an exposure to loss only. The variable in the process of a construction project become as a risk in relation to construction whose variation results in uncertainty as to the final cost, duration and quality of the project. Based on previous studies, clearly shows that the risk might be affect the cost and it became a major factor contribute to the cost overruns. Nowadays, many companies have practices on the risk assessment to detect and provide contingency plan to face the risk in projects. However, sometimes a manager forgets about the technical risk that have a high probability to appear in the project.

The purpose of this study is to study the way on how to reduce the cost of production by managing the technical risk. Technical risk is a type of risk that we will never aspect. It included overall process during the production of the product, since the company cannot reduce other costs in the production such as cut the cost of material. In the project, there has some problem that known as triple constraint. The managers were used the project management triangle to analyze or understand the difficulties that may come up due to implementing and executing a project. All

projects inconsiderate of their size will have many constraints. Although there are many such project constraints, these should not be the barriers for the effective decision making and for successful project execution. There are about cost, time and scope. If we change one of the constraint it might be affect to the other side. So, in this study we will study on cutting the cost without affecting the triple constraint which is by managing the risk that might be appearing in the project. Quality is the main objective of every delivery, not a project management triangle division. Hence, the project management triangle symbolizes the quality. The thought that mention 'high quality comes with a high cost' are usually come under many project managers, which to some extent is true. To accomplish project deadlines by using low quality resources does not ensure the success of the whole project. Same goes with the scope, quality will also be an important deliverable for the project.

In the industry, there are many projects that need to be well managed. In order to manage the project well, there are not only need to have better planning and scheduling, but there also needs a good management on risk. Risk is the strongest enemy of the project because less focuses on the risk appears may cause the project failure. Besides that, in the term of cost risk, it also might affect the cost of production badly if the risk was not managed very well.

There are many types of risk that may appear in the project. On this study, we will decide to specify the research about the technical risk that might be appearing in the project. We believed that by managing technical risk, the company can cut the cost of the production. However, there are proven by other research and in this research we will put an effort to prove it. The risk that related directly to the knowledge base being employed and its technical parts involving such things as understanding, reproducibility and the like are the explanation of the technical risk. Technical risk also includes the whole activities in the project such as design and engineering, manufacturing, technological processes and test procedures.

Technical risk is the risks that are coming from the overall process of the production in the company. Technical risk should manage very well to ensure the cost of production getting lower as have been planned and it will automatically reduce the price of the product. However, the problem in the company is technically risky, which a type of risk that we will never expect to be appeared during the process of production. The company should have a good team in managing the technical risk since it will be appear suddenly during the process. It may be a serious effect to the overall production if the risks are not managed well.

1.3 Problem Statement

Nowadays, world have to face an economic problem and unstable economically. In Malaysia there also has the same problem. Apart from that, the cost to produce the product was increase rapidly and cost to get the equipment also increase. This problem causes the customer have a problem to buy the product that produce by the company because the cost of production increase and it automatically increase the market price of the product. In order to provide customer with good product or services, a company should reduce the cost of production and directly reduce the market price of the product. When the cost of production was successful being reduced, the company will get the customer satisfaction and company also can get the competitive advantages among the other competitors.

There is a problem of reducing the cost of production which is there are no pointers to reduce the price of material and others price because the price is fixed from the supplier. A company should look for the other ways to reduce the cost of production in order to ensure that their product get fulfill the customer demand and gain the competitive advantages. The better ways in cutting the production cost is company should reduce the cost that are coming from their company itself such as managing risk.

In a company, risks always become a big problem to them. Risk may affect the cost very bad and sometimes a small risk capable to change the company goal and objectives. In managing the technical risk, it is needed to be done by people. The company should assign good team and train them to manage the risk that might appear.

In conclusion, for those companies want to reduce the cost of the production, the company need to focus on managing the technical risk. Managing technical risk will not involve too much costing, but the result that the company gets will be a positive result of the cost of production. However, the company should identify the technical risk appear in the production and provide it with a good plan on how to manage the technical risk. Even though the company does not know when the technical risk might be appear, but it still can manage if the entire employee work together and be ready to the risk.

1.4 Aim of this study

This study is focused on the technical risks that might appear in the project and affect the cost of production. I will study on how bad and the production results if the technical risk affects the cost of production. Besides, this research also will study about the technical risk, when the types of risk will be appearing and how well a company ready to face the technical risk. We cannot expect when the risk will appear because the technical risk not same as other risks. Furthermore, the technical risks involved in the entire process of production in a project. In short, the purpose of this research is to study the effect of technical risk towards reducing cost of production in industries.

1.5 Scope of study

The scope of this research is to study about the ways to manage the technical risk appear in production and its effects on the cost. This study is also conducted with the purpose to identify the technical risk appears in the company during the production. This study will be conducted at an industry at Terengganu which is PETRONAS. This company is actively involved in oil and gas industry. As we know that PETRONAS have many plants and I decide to choose one from the plant which is a gas processing plant. This study will be conducted in PETRONAS because oil and gas industry is most risky industry. It will help this study in gaining data. Besides, PETRONAS was chosen because PETRONAS is a big company in Malaysia. Hopefully the this company ready to help in accomplishing this study.

1.6 Significance of study

Nowadays, the cost of production becomes a famous topic to discuss among managers in a company and it also sameness to the customers. Cost becomes a primary criterion that is looked by customers besides the quality of the product. However, the price of the product depends on the cost of the production. Mangers should know the best ways to reduce the cost of the production first then the price of the product will automatically reduce.

This study will be conducted in order to study about the relationship between technical risk and cost of production. As we know, the managers are difficult to reduce the price of materials and others cost in the production because all of the cost is fixed. That is why I have decided to conduct a study about the technical risk affect the cost of production. For those industries that are wanting to reduce the cost of production, they should give a bit attention on their technical risk, so they can reduce the cost and the price of the product. Besides that, the company will gain the competitive advantages if they are success to implement and manage the technical

risk. In addition, in a project there is no any budget to recover the technical risk because the technical risk have never been expected to appear. It can happen to the workers and machinery as an example. The benefits of this study are more to the industries especially in getting the competitive advantages and fulfill the customers demand.

Besides that, this research also will be significant to others student. This study will show to them that the important of managing the risk well because they will go and work in industries later on. So, before they go to work they will know how important to manage the risk and the effect of the risk to the project and the cost of the project.

Last but not least, this study will give a lot of benefits to all people either individual or group. After this research, the company will realize that there have several ways to control and reduce the cost due to the increasing price of the material. I also believe this research is very helpful to all of the company due to the world economic problem and it also will continue until the economy is recovered by the responsible person. In this study, I want to study about managing the technical risk can reduce the cost of production. This study can help me to know what the technical risk really mean and how the technical risk might affect the cost of production. To manage the technical risk, all of the people start from upper level to the lowest level should give cooperation to ensure the process is successful. Lastly, the information obtained in this study can then be publicized and used as a guide to do research in the near future.

1.7 Research Objective

1. To identify the technical risk appear in production in industries
2. To measure effect of technical risk toward cost of production

1.8 Research Question

1. What are the technical risks may appear in the production

2. How well a technical risk may affect the cost?

1.9 Expected results

In this study that's been conducted it more focusing on technical risk that appear in the production of a project or production to produce a product. Based on the objective of this study, the researcher want to study about the ways to identify and manage the technical risk that appears in a project. Besides that, the researcher also wants to identify the impact of the technical risk appear towards the cost of the project.

The expected outcomes for this study is wanting to reduce the cost of the production product by managing the technical risk. Based on previous studies, failure to manage technical risk causing in a lot of loose. For example in Chunnel project the manager failed in managing the technical risk and effect due to that event the actual cost of the project was over then baseline cost where US$2. 25billion need to add to complete the project. Researcher hopes that it can help a lot of industries that have a problem in cutting the cost of production and to fulfill the demand of customers that want a product with the lowest price rates. However, the increasing cost of living nowadays, it is seen possible to cut the cost of a product directly through the price of materials used. That the purpose of this study being conducted.

Last but not least, researcher expects that by managing the technical risk, cost of production will be reduced. The organization can satisfy the customers by reducing the price rate of the product because the cost to produce the product was decreased without any effect on the quality of the product.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Project risk management is important and should have in any project in the world. The risk in the project will give a big effect to the overall of the project in every scope such as schedule, quality and cost. The risk also makes the project performance are low rather than what the organization low. It is important to ensure projects are running smoothly and to deliver a quality product or services to the customers. There are many ways to detect and identify risk. While the risk has been identified, they should manage and avoid as well as an organization can. When the risk getting worse, the other problem might come and it can be the root cause for the filing of the project and delay. In an organization, failing to manage the risk show to customers that the organization is very low in performance and not capable to manage a project. There can give an effect either for the company or individual in the company.

Since the customers have a lot of demands, so project manager should have a ways to manage it all with some flexible decisions. It's purpose to ensure their customers are satisfied with the project deliveries and company can provide customers' demands without any defect. Normally, the risk comes from the customers because they have the ability to control the project.

When this problem happens, the project manager should have an appropriate skill to manage this type of customers. This problem might be solved easily by the expert manager however, other risks are very complicated to solve. It will involve a lot of thing and component in the project. As the ways to manage that, the manager should detect and identify the risk before the project start. It will completely help in develop contingency plan to manager to avoid the risk. Method in the risk identification is used to identify and provide a plan to the risk should be look and written down. In addition, it also needed to make project team aware with the potential risk.

2.2 To identify the technical risk appear in production in industries

Risk can be defined in as negative or positive impacts that affect the objective of the project. Positive impact classifies as the chance to the investment in the project to get higher when the risk is accepted in the project or the investment value gain more than expected.. Companies nowadays are willing to spend large amounts of money and time to provide risk management strategies in a project with the purpose to manage risks associated with their project and business.

In order to make the project successful risk must be managed effectively and efficiently, there has a process which consists of risk assessment, it was included identification of risk, analysis and prioritization the risk and controlling and monitoring risk, it also includes a risk management plan, risk monitoring planning, risk tracking and corrective action if the risk happens. Baskerville, R. (2011) stated

that in a project risk management consists of methodologies for managing software analysis, response planning toward any uncertain event, tracking and control ongoing risk towards communications effort. Project Management Institute (PMI) presents four phases of the project risk management process, start from identification, quantification, response development and control.

Actually, there has a lot of methods to identify a risk. The identification of risks consists of a method used to identify the risks in several activities of project, and the guidance to mitigation plan towards what those risks should look like when written down. Normally, the risk in the project will be identifying while the project is in the planning stage. The problem here is the risk can be detect in the planning stage are only the minor and can be solve easily. The real risk will appear while the project is in the execution stage. The manager should be careful with the risk that appears during the execution because if there are wrongly solve the project may be affected.

During the detection of the risk, basically manager does not know how to identify risk accurately. It only can detect the likelihood of the risk may appear. Besides the manager not know what the relevant method can be used in the different type of project. According to Akintoye A., Taylor C., and Fitzgerald E. (2008), it is important to manage risk in a project. It consider as the need and relevant to all professionals and groups in project such as client groups, design team, project management team and contractors which are concerned with cost, time and quality. The purpose of this study is to find what are the method suitable can be used in each type of project.

The risk is only what we are plan, however it can be changing according to the time by time. In planning process, basically the project manager only briefing to the staff roughly about the project. However, this stage is an important stage because it became a sign whether the project should success or not.

Previous study conducted to integrated analytical framework for effective management of project risks using combination of multiple criteria from decision-making technique and decision tree analysis. First, a conceptual risk management model was developed through thorough literature review. According to Kumar Dey (2011), in the proposed framework, risks are identified using cause and effect diagram, analyzed using the analytic hierarchy process and responses are developed using the risk map. Additionally, decision tree analysis allows modeling various options for risk response development and optimizes selection of risk mitigating strategy.

According to Merritt G. M and Smith P. G. (2004), risk management is a technique for controlling the uncertainty event in a project. A lot of method can be used to measure the risk because there are the advantages to every types of it. However, managers should choose best ways to ensure all of the party is getting right information about a risk.

Brainstorming is a commonly method used for identifying risks in the planning process, It is simple and easy method to explain and normally used to identify risk in project. This method is easy to understand and easy to know probability risk might be appearing in the project because all parties involved in the process to identifying. This method also easier to identify and decide not related risk in the project.

The most difficult aspect of the facilitating type of development is guidance about the form of words to use when describing a risk. Discriminating between today's problems and potential future problems or risk was tricky, but discriminating between a risk and its impact was even trickier. It was possible to eliminate the tendency to do well on known issues such as 'incomplete requirements' or 'insufficient resources' by defining a risk as a potential future problem.

Since, the risk is a large branch in a project, this paper has focused on a type of risk which is technical risk. Technical risk can be defined as risk associated directly with the knowledge base being employed and its technical aspects including such things as understanding, reproducibility and the like. Technical risk also involves the overall activities in the project such as design and engineering, manufacturing, technological processes and test procedures. This type of risk need to be manages well because it happens suddenly and unexpected presence.

2.2.1 Risk identifies in the planning phase

This paper is focusing on the technical risks that appear in the production process in industries. As we know that the technical risk involved the overall process in the production to produce a product. In all industries, the top management is always stress on the risk especially risk that gives them a lot of problems. Technical risks were included in the type of risk that will give a lot of problems to the organization. It can change the project scope and even can make a project fail. It clearly shows that technical risk such an important type of risk that need to be controlled and be defined clearly during the first step on the project.

McGill, J E (2005) state that it is important to note that treatise will concentrate on technical risk as it relates to mineral resources risk issues, and the related impact on the junior and small scale mining sector of South Africa. Mining is very technical industry. Technical risk can relate to any of the technical requirement within mining. Technical risk will be prevalent in all decisions relating to mining, rock engineering and engineering metallurgy as example. In an attempt to identify a unit of measurement for technical risk, acceptability criteria such as times it takes for failure or number of fatalities may be considered. Most often, risk is also calibrated in financial terms.